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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,272	11/25/2003	HeeDong Lee	UNI 0050 PA/40809.67	1249

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EXAMINER

KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/724,272

Applicant(s)

LEE ET AL.

Examiner

C. Melissa Koslow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 and 42-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☒ Claim(s) 42-47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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This action is in response to applicants' amendment of 9 May 2005. The amendment to the specification has overcome the objection to the specification as failing to provide proper antecedent basis for the claimed subject matter. The amendment to the claims have overcome the objections to the claims and the 35 USC 112 first paragraph rejections, the 35 USC 112 second paragraph rejections over claims 17, 21, 23, 27, 32, 34, 35 and 39 and the art rejections over claim 48. Applicants' arguments with respect to the 35 USC 112 rejection over claims 16 and 31 were persuasive. Applicant's arguments with respect to the remaining rejections and objection have been fully considered but they are not persuasive.

The indicated allowability of claims 22, 28-30, 33, 36 and 37 is withdrawn due to applicants' amendment to claim 22.

The disclosure is objected to because of the following informalities: Paragraph [0006] teaches the compact comprises a powder mixture having doped yttrium aluminum perovskite, but the other powder in the mixture is not defined. In addition, the phrase "powder mixture having doped yttrium aluminum perovskite" is unclear as to its meaning since powder mixtures do not have powders, but are composed of powders. Appropriate correction is required.

Applicants' arguments with respect to this objection are noted but are not convincing. First, this objection is not an objection under 35 USC 112, but due to informality in the specification. The phrase "powder mixture" implies that at least two powders are mixed together, but the sentence using this phrase only define one powder and there is no indication in the rest of the specification as to what other powder can be present in this powder mixture. The objection is maintained.

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Claim 40 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This claim states the compact can comprise a powder mixture having doped yttrium aluminum perovskite, but the other powders in the mixture are not defined in the claim or the specification and there is no guidance given in the specification as to the composition of these other powders.

Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 40 is indefinite as to the meaning of "powder mixture having doped yttrium aluminum perovskite". Powder mixtures do not have powders, but are composed of powders. Claims 1-39 are indefinite since it is unclear what is being produced by the claimed methods, a powder, a transparent polycrystalline article or a yttrium aluminate garnet (claims 1-21) and a yttrium aluminate perovskite (claims 22-29). Claims 1 and 22 are indefinite since there is no teaching as to how combining salts or alumina and a salt from an aqueous mixture. The essential step of adding water to the combined salts or alumina and salt is missing from these claims. See MPEP 2172.01.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,114,702 in view of U.S. patent 5,484,750.

U.S. patent 5,114,702 teaches the process for forming any ceramic powder by forming an aqueous mixture from stoichiometric amounts of salts of the desired metals which appear in the ceramic, adding a combustible amino acid and ammonium nitrate to the mixture, heating the mixture at a temperature such that the mixture undergoes combustion and a powder is formed and then calcining the powder to form the ceramic. The metal salts can be perchlorates, sulfated and preferably nitrates, such as those in claim 9 (col. 3, lines 1-44). The amino acid can be alanine, which suggests that any form or combination of forms of alanine can be used. The molar amount of amino acid and ammonium nitrate is about 0.5-6 times the amount of metal cations (col. 3, lines 59-68), which overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The mixture is concentrated by evaporating water by heating before the combustion step. The powders resulting from this process have a primary size in the range of 20-300 nm, which encompasses the claimed range. While U.S. patent 5,114,702 only gives the combustion temperature for glycerin, it teaches that the temperature range is that which fully consumes the amino acids but does not cause the resulting particles to fuse and/or sinter. This range would be expected to overlap the claimed range when the selected amino acid is alanine, which appears to achieve this purpose. While U.S. patent 5,114,702 exemplifies calcining at 700°C or less, it also teaches calcination in general. This suggests to one of ordinary skill in the art that any

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calcination temperature range that is sufficient to convert the ash resulting from the combustion process to the desired material and to drive off any remaining organic residues and does not promote crystal growth is acceptable. This would include values greater than 700°C up to less than those temperatures used in the conventional solid processing where mixtures of oxides are calcined together to form the desired material, and which are discussed in column 1 of Pederson. While U.S. patent 5,114,702 does not teach de-agglomerating the powder before calcining, one of ordinary skill in the art would have found it obvious to do this to ensure there is no sintering between the powder particles. U.S. patent 5,484,750 teaches forming doped YAG ceramics from YAG powders, which can contain cerium or neodymium dopants. Thus, it shows that YAG powder is known and desirable in the art. Accordingly, one of ordinary skill in the art would have found it obvious to form YAG powders by the method of U.S. patent 5,114,702, which means the metals are Al and Y and optionally Ce or Nd and the molar ratio of Al to Y or, Y and Ce or Nd, is 5:3. The references suggest the claimed process.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,484,750 in view of U.S. patent 5,114,702.

U.S. patent 5,484,750 teaches forming a transparent polycrystalline yttrium aluminum garnet by forming a compact from a single phase cubic yttrium aluminum garnet powder, sintering the compact at 1400-1600°C and then hot isostatically pressing the sintered compact at 1350-1600°C at 5-25 kpsi. The taught sintering conditions and hot isostatic pressing conditions overlap those claimed. This patent does not teach the claimed method for producing the powder used in the method, but it indicates that any known precipitation method can be used to form the powder used in the taught process (col. 20, lines 50-67). As discussed above, U.S. patent

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5,114,702 suggests the claimed process for producing a doped YAG powder. Therefore one of ordinary skill in the art would have found it obvious to use a doped or undoped YAG powder produced by the process suggested by U.S. patent 5,114,702 and then to form a transparent polycrystalline YAG ceramic from this powder using the process suggested by U.S. patent 5,484,750. The references suggest the claimed process. Since the process is suggested, one of ordinary skill in the art would expect the suggested process to produce a transparent article having a mean grain that overlaps that claimed, absent any showing to the contrary.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicants argue the deficiencies of U.S. patent 5,114,702 (Pederson) and states that U.S. patent 5,484,750 does not cure the deficiencies, but they never state why it would not have been obvious to form YAG powders by the method of Pederson or why it would not have been obvious to use these powders in the process of U.S. patent 5,484,750 to make a transparent YAG ceramic.

Applicants' arguments have been considered but are not convincing. Applicants state U.S. patent 5,114,702 (Pederson) does not teach the amount and/or ratio of amino acid and ammonium nitrate added to the salt mixture, but column 3, lines 59-68 teach the total amount of amino acid in the mixture, which would include ammonium nitrate that is added to increase the bulk volume of ash, to metal cation is 0.5:1 to 6:1 in order to produce the largest bulk volume of ash. It is clear that when the ratio is calculated with the metal salts instead of the taught metal

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cations, the range will still overlap that claimed. There has been no showing that there is no overlap. Applicants argue Pederson does not teach all the claimed limitations of claim 1 in that it does not teach the claimed temperature range and that it teaches away from the claimed temperature range. As discussed above, this reference does suggest the claimed temperature range. Pederson also does not teach away from the claimed range since the claimed range is does not promote crystal growth and thus must be lower than the temperatures discussed in column 1 of the reference. The fact Pederson does not teach YAG powders does not overcome the rejection since it was combined with U.S. patent 5,484,750 to show it would have been obvious to produce YAG powders by the method of Pederson. The rejections are maintained.

Claims 42-47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 22-40 would be allowable if rewritten or amended to overcome the objections and rejections under 35 U.S.C. 112 set forth in this Office action.

The subject matter of these claims would be and is allowable for the reasons given in the previous action.

Applicant's amendment and arguments necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk
June 17, 2005



C. Melissa Koslow
Primary Examiner
Tech. Center 1700